The Consequences of Exposure to Air Toxics Risk on the School-Aged Population in Michigan

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Background and Objective: There has been considerable interest in understanding racial and socioeconomic disparities in the distribution of air pollution. However, most studies have focused on the adult population, rather than on children, although children are more vulnerable. Their lung function has not been fully developed and their airways are narrower. They breathe in greater levels of polluted air relative to their weight and spend more time outside when air pollution levels are the highest. Thus, this study sought to understand the distribution of air pollution from industrial sources around schools in Michigan, whether racial and socioeconomic disparities in such distribution exist, and whether these burdens are linked with student performance and health.

Methods: Geographic information systems were used to link school, census, and air pollution data. Statistical analyses were used to examine racial and socioeconomic disparities in the distribution of pollution burdens around public schools and whether such burdens are related to student performance and health.

Results: Racial and socioeconomic disparities at the school- and neighborhood-levels exist in the distribution of air toxics generated from industrial sources in Michigan. Furthermore, air toxic burdens within 1.0 km, 2.0 km, and 3.0 km of the schools are associated with low student performance and high drop rates.

Conclusion: Environmental justice policy needs to give greater attention to environmental quality around public schools. Policies should focus on avoiding locating schools in areas of poor quality. Pollution around existing schools near industrial facilities should be monitored and ameliorated where found to be at unacceptable levels.